**UNITED STATES OF AMERICA**
**NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD PANEL**

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**In the Matter of**
**South Texas Project Nuclear Operating Co.**
**Application for the South Texas Project** **Docket Nos. 52-012, 52-013**
**Units 3 and 4**
**Combined Operating License**

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# INTERVENORS' CONTENTIONS REGARDING APPLICANT'S PROPOSED REVISION TO ENVIRONMENTAL REPORT SECTION 7.5S AND REQUEST FOR HEARING

## Introduction

Pursuant to the Board's Order of December 4, 2009 the Intervenors hereby present their contentions regarding the Applicant's November 10, 2009 Proposed Revision to Environmental Report Section 7.5S.[1] Contention 21 of the Intervenors' initial Petition to Intervene on April 21, 2009 was admitted by the Board's Order of August 27, 2009. On November 30, 2009, the Applicant moved to dismiss Contention 21 as moot. The Intevenors responded on December 14, 2009 opposing the Applicant's motion and modifying the initial contention. The Intervenors' new contentions herein are in addition to the modified contentions and should not be construed as a waiver of Intervenors' arguments in opposition to Applicant's motion to dismiss Contention 21 or a waiver of the proposed modifications to Contention 21.

[1] The Board's Order of December 4, 2009 extended the deadline for new contentions to December 21, 2009. Consistent with 10 C.F.R. § 2.306(a), the Board's Scheduling Order of October 20, 2009 states "if any deadline prescribed by this scheduling order would fall on a Saturday, Sunday, Federal legal holiday, or a day on which NRC headquarters does not open for business due to an emergency closure of the Federal Government in Washington, D.C., then the deadline will be considered to fall on the next day that is not a Saturday, Sunday, Federal legal holiday, or emergency closure." The emergency closure of the Federal Government on December 21, 2009 due to a snowstorm extends the deadline to December 22, 2009.

**Legal basis for contentions of omission**

10 C.F.R. § 2.309(f)(1)(v) requires the Intervenors to provide a concise statement of the facts that support their positions and upon which they intend to rely at the hearing. However, the requirements of 10 C.F.R. § 2.309(f)(1)(v), that generally call for a specification of facts or expert opinion supporting the issue raised, are not applicable to a contention of omission beyond identifying the omitted information required under the regulation in question. North Anna, LBP-08-15, 68 NRC (slip op. at 27) (quoting Pa'ina Hawaii, LLC (Materials License Application), LBP-06-12, 63 NRC 403, 414 (2006)). Thus, for a contention of omission, the Intervenors' burden is only to show the facts necessary to establish that the application omits information that should have been included. The facts relied on need not show that the facility cannot be safely operated, but rather that the application is incomplete. Catawba Nuclear Station, Units 1 and 2, CLI-02-28, 56 NRC 373, 383 (2002).

The contentions herein are both substantive and omission based. Contentions CL-1, CL-2, and CL-3 are omission based.[2] Contention CL-2 is omission based to the extent it points out the inaccuracies of the projected costs of replacement power. It is substantive to the extent the contention determines alternative cost projections for replacement power.

When an unsubstantiated assertion of fact by the Applicant raises a material dispute, there is a basis for contentions. It is within the scope of this proceeding because it deals with impacts related to co-location of nuclear plants and as such is material to the decision the NRC must make concerning licensing. 10 C.F.R. § 2.309(f)(1)(iii)(iv) and 42 U.S.C. § 2133(d). The failure to substantiate is also an omission by the Applicant and a basis for an omission contention. See *North Anna, infra.*

[2] The Intervenors will reference the co-location contentions herein by CL-1 – CL-4.

**Summary of Contentions**

CL-1. The STPNOC evaluation of the possible impacts of a severe accident at one of the STP units on the other STP units is inadequate

CL-2. The Applicant's quantification of the probable replacement power costs in the event of a forced shutdown of nuclear units on the STP site is inadequate and understates the replacement power costs which would be incurred.

CL-3. The Applicant's quantification of the replacement power costs in the event of a forced shutdown of nuclear units on the STP site is inadequate in that it does not take into account the increase of ERCOT market prices due to the market effects of a STP outage.

CL-4. The Applicant's Environmental Report is inadequate in that it does not evaluate or take into account the impacts on ERCOT consumers and the disruptive impacts of potential price spikes and grid outages, which could be triggered by the simultaneous shutdown of all four units at STP.

**Contentions**

**CL-1. The STPNOC evaluation of the possible impacts of a severe accident at one of the STP units on the other STP units is inadequate.**

Intervenor Expert Dr. Edwin Lyman is responsible for the fact basis and analysis in Contention CL-1.[3]

**A. The Amended ER §7.5S.3 states that the time from general emergency warning until the first release of radiation was of sufficient duration in all ten accident scenarios to put unaffected units into stable long term decay heat removal condition. However, in Applicant's accident scenario eight**

[3] See attached declaration.

**the release occurred prior to bringing unaffected units into stable long-term decay heat removal condition. Therefore, the proposed amendment to the ER is not adequately substantiated.**

The STPNOC evaluation of co-location impacts, Section 7.5S of the Environmental Report, claims that

> "… If the time increment between the onset of the accident and the airborne radioactivity release at the affected unit is longer than the time it takes to place the reactor into a stable long-term decay heat removal condition (approximately 3 hours), then there would be no impact on safe shutdown of an affected unit." (ER Section 7.5S at 2.)

The report then claims that for all ten internally initiated severe accident sequences that are evaluated in the ABWR DCD,

> "the time increment from general emergency warning time until the first release of radioactivity to the environment … is greater than the time required to put an unaffected unit into a stable long-term decay heat removal condition"

and that

> "therefore, any doses experienced at the control rooms of STP 1 & 2 or the unaffected ABWR unit from a severe accident at either STP 3 or 4 would not prevent the operators from completing safe shutdown of the unaffected units." (ER Section 7.5S.3 at 4.)

Section 7.5S of the ER does not provide the time increments between the general emergency warning time and the first release of radioactivity to the environment for the ten internally initiated severe accident sequences analyzed in the ABWR DCD (and therefore applicable to STP 3 & 4), or provide any specific references where that information can be found. Nor does it provide comparable information for STP 1 & 2.

Moreover, Chapter 19 of the ABWR DCD also does not appear to be available on the NRC web site. However, the Intervenors received it through the mandatory disclosures relevant to the initial Contention 21. According to the DCD, for Case 8, the radiological release to the environment commences after 2

hours, or 1.2 hours after the declaration of a general emergency.[4] Therefore, the assertion in Section 7.5S that three hours will be available for every internally initiated severe accident sequence defined in the DCD is wrong for the early containment failure sequences described by Case 8. Consequently, Section 7.5S as written falls short because it does not address the environmental impacts on co-located units resulting from a severe accident at STP 3 or 4 with early containment failure. It must analyze the possibility that beyond design-basis radiological releases may reach the control rooms of the co-located units before those units can be put into stable configurations, either requiring the control rooms to be evacuated or operators to receive potentially life-threatening exposures.

**B. The proposed amendments to the ER do not address the radiological impact of a severe accident at an STP unit during shutdown, when the primary containment head is removed, on the other STP units.**

The proposed amendment to section 7.5 S is also deficient because it fails to consider severe core damage events that might occur during shutdown of one of the units. The ABWR large release frequency (LRF) does not contain contributions from severe accidents during low power or shutdown operations, despite the fact that more recent design certification PRAs have shown that such scenarios are significant and sometimes dominant contributors to LRF.[5]

In the case of shutdown for refueling of the ABWR in particular, according to the NRC, "the primary containment head is removed and cannot be readily repositioned to restore containment integrity," and "NUREG-1449 stated that BWR secondary containments were judged unlikely to prevent an early release following initiation of boiling with an open RCS or during potential severe-core-damage scenarios. This

[4] ABWR DCD, Rev. 0, Table 19E.3-6 at 19E.3-9
[5] Tom Tai, NRC, "Request for Additional Information Letter No. 124 Related to SRP Section 19 For the South Texas Project Combined License Application," June 17, 2009, RAI 19.3 at 5.

is also the case for the ABWR."[6] Fuel damage events occurring during refueling outages have a much higher risk of early large radiological releases to the environment than when the reactor is at power, and therefore should be events of particular concern with regard to any analysis of co-location environmental impacts. Instead, they are ignored.

**C. The amendments to the ER fail to evaluate the impact of a severe accident at one STP unit on the other units when the initiating event of the accident is an external event such as an earthquake, that could result in common-cause failures of systems at one or more of the other units, potentially extending the time necessary for operators to put the units into stable long-term decay heat removal configurations.**

Section 7.5S of the ER only considers severe accidents associated with internally initiated events and hence assumes that such accidents would only initially involve one of the co-located units. All others are assumed to be unaffected and hence would have all systems available in the event that operators need to put them in stable long-term configurations. However, this analysis fails to consider severe accidents caused by external events, such as earthquakes, that could also result in common-cause failures of safety systems at one or more co-located units. In such scenarios, additional time may be required to restore operability of safety systems and achieve stable long-term configurations, increasing the risk that stable shutdown will not be achieved and core-melt may occur at one of the other units.

Excluding seismic and other external events from the analysis also doesn't make sense because they are large – possibly even dominant – contributors to the overall plant risk profile. According to the ABWR

[6] NUREG-1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design" at 19-81.

FSER, "if external events are included, the estimate of ABWR risk could be one or possibly two orders of magnitude higher" than analyses that consider only internal events.[7]

**D. The amended ER fails to fully evaluate the impact of a chain-reaction that leads to more than one unit experiencing a severe accident**.

Section 7.5S of the ER concludes that even if all four co-located units were to have simultaneous severe accidents, the environmental impact would remain small because the individual risk associated with each plant is small. However, if the units were indeed coupled in that a severe accident affecting one would likely lead to comparable accidents in one or more of the co-located units, then the combined radiological consequences could have a significant impact on the ABWR severe accident mitigation design alternatives (SAMDA) analysis.

**CL-2. The Applicant's quantification of the probable replacement power costs in the event of a forced shutdown of nuclear units on the STP site is inadequate and understates the replacement power costs which would be incurred.**

Intervenors' Expert Clarence Johnson's report provides the basis for this contention.[8] Johnson's analysis demonstrated how the use of generic replacement power costs by the Applicant does not reflect the specific characteristics of ERCOT (Electric Reliability Council of Texas). His analysis found that the replacement costs per day developed by the Applicant are substantially lower than baseline ERCOT power prices in 2020.

[7] Id. at 20-88.
[8] Johnson, Clarence. Review of Replacement Power Costs For Unaffected Units At the STP Site. December 21, 2009 (Johnson Report)

According to references in the Applicant's Proposed ER Revision the replacement power costs relied on by the Applicant are apparently "derived from modeling of various power pool costs in the 1990's" and do not seem to take into account the restructuring and deregulation of the electric industry subsequent to the 1990s.[9]

Johnson's conservative forecast of baseline ERCOT market prices in 2020 shows:

> [T]he cost of replacement power for the ABWR unit is **$1.66 million per day**. Based on the present value (at 7%) over the six year period, the replacement cost per day is **$1.3 million per day**. These costs are roughly 3 to 3.8 times the $430 thousand/day cost used by the Applicant.[10]

Johnson further explains that this replacement power forecast is "below the likely replacement power costs which would be incurred," because "[t]he removal of STP units output from the ERCOT market will increase the average ERCOT prices above the forecasted levels."[11] Deregulation, ERCOT's limited interconnection to other power markets and ERCOT's relatively small size all contribute to pricing in the ERCOT region being "more sensitive to significant capacity outages."[12]

**CL-3. The Applicant's quantification of the replacement power costs in the event of a forced shutdown of nuclear units on the STP site is inadequate in that it does not take into account the increase of ERCOT market prices due to the market effects of a STP outage.**

As mentioned above, Johnson's replacement power forecast is not only 3 to 3.8 times the cost used by the Applicant but is lower than the actual replacement power costs because neither the Applicant nor Johnson took into account the impact of a STP outage on ERCOT market prices. This contention is one of omission and is supported by the Johnson Report.

[9] Johnson Report, p.2
[10] Id, p.4
[11] Id, p.4
[12] Id, p.3

Johnson explains how removing STP generation from the ERCOT market will allow less efficient units to set the market price. He goes on to describe how STPNOC will be forced to buy power to replace the output of the units shutdown.

> Not only will the ERCOT power be higher cost than the STP variable cost, but the costs of power within ERCOT, at the same time, will rise due to the loss of the STP generation. This could be viewed as a substantial premium which the STP owners would have to pay above normal ERCOT prices.[13]

This premium associated with the increase in market prices due to a STP outage should have been evaluated by the Applicant.

**CL-4. The Applicant's Environmental Report is inadequate in that it does not evaluate or take into account the impacts on ERCOT consumers and the disruptive impacts of potential price spikes and grid outages, which could be triggered by the simultaneous shutdown of all four units at STP.**

Johnson's report also discusses some of the substantial impacts a four-unit shutdown at STP could have on ERCOT consumers. The Applicant should have evaluated and taken into account these impacts. This contention is one of omission and is supported by the Johnson Report.

Johnson's report states that "the loss of STP generation will affect all consumers within ERCOT--and not those just served by the STP owners-- by increasing overall average prices."[14] Johnson's report also describes how a four-unit shutdown at STP "is likely to exacerbate scarcity conditions" and "likely to produce price spikes in the ERCOT market," given STP's normal continual operation and the large block of capacity represented by the four units. "Price spikes have a direct impact on average ERCOT prices," but price spikes "can also produce indirect impacts, in terms of economic dislocation." [15] The Applicant also failed to take into account the possibility that a four-unit shutdown at STP "could trigger controlled

[13] Id,p.5
[14] Id, p.5
[15] Id, pp.5-6

or uncontrolled power outages," which could "produce severe economic damages beyond replacement power costs."[16]

**Conclusion**

Based on the arguments and authorities above, Intervenors urge that the contentions specified herein be admitted for adjudication and that a hearing pursuant to 10 C.F.R. Part 2, Subpart L be ordered for these contentions.

Respectfully submitted,

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[16] Id, p.7

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## CERTIFICATE OF SERVICE

I hereby certify that on December 22, 2009 a copy of "Intervenors' Contentions Regarding Applicant's Proposed Revision to Environmental Report Section 7.5S and Request for Hearing" was served by the Electronic Information Exchange on the following recipients:

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